REMARKS

Applicant respectfully requests reconsideration of this application. Claims 10-25 were pending in the application. In this response, no claims have been amended, added, or deleted. Therefore, Claims 10-25 are pending in the application.

The Claim Objections

"Notional circle"

The Examiner has objected to Claims 10-25 as being unclear because the term 'Notional circle' was not understood. The term "notional circle" is used in claims 10, 11, 18, and 19, to describe how the various coil means are located relative to the conductor whose current is to be measured. A "notional circle" is a conceptual description of an imaginary circle that is formed when the various coil means are placed in their appropriate positions, the coil means being located at points on this circle. The apparatus is configured so that a conductor can be introduced into the centre of this notional circle (i.e. the conductor can be located at the interior of the various coil means).

With reference to Figure 5 of the present application, examples of two different, yet concentric, notional circles are shown (formed with dashed lines). The first notional circle is shown to have a radius of r_1, while the second notional circle has a radius of r_2. Four coils can be seen to be located upon the first notional circle – inner coils a1x, b1x, c1x, and d1x, while four other coils are shown located upon the second notional circle – outer coils a2x, b2x, c2x, and d2x.

In the application, the axis of the coils is described as being the axis around which the coils are turned. If we define the axis of a coil to be along the line that bisects a coil symbol of Figure 5 along its width, then the coils shown in Figure 5 can be said to have axes substantially parallel to each other. Looking at Figure 5, it can be said that the axes of coils a1x and b1x are tangential to the first notional circle upon which they are located – the axes touch the circumference of the notional circle at one point only. Accordingly, the axes of coils c1x and d1x are seen to extend radially of the first notional circle upon which they are located – they extend along a line that can be said to be a radius of the notional circle.

To explain the concept of the "notional circle" in the context of claim 10, it is best to take the example of Figure 6. Taking for example the first and second coil means as being equivalent to coils a1x and d1x respectively, it is seen that they both have substantially parallel axes, and are both located on the notional circle having a radius r_1. However, due to their positioning, the

axis of coil a1x is tangential to the notional circle, while the axis of coil d1x extends along a radius of the notional circle.

Now, taking the third and fourth coil means as being equivalent to coils a1y and d1y respectively, it can be seen that coils a1y and d1y both have substantially parallel axes, and are located on the notional circle having a radius r_1. From Figure 6, it can be seen that coil a1y is located close to coil a1x, and coil d1y is located close to coil d1x. Due to the positioning of the coils on the notional circle, the axis of the third coil means (a1y) extends along the radius of the notional circle, while the axis of the fourth coil means (d1y) is tangential to the same notional circle.

The Applicant respectfully submits that the above description of the concept of the "notional circle" clarifies the use of the term in the claims.

"Turns-area product"

The Examiner has objected to Claims 10-25 as being unclear because the term 'Turns-area product' was not understood. The term "turns-area product" simply means the product of the number of turns in a coil and the area of the coil. The significance of this will be apparent to the skilled person from Faraday's Law of Induction, which states that the magnetic flux through a coil (Φ) is equal to the magnetic field component perpendicular to the coil ($B^{\perp}$) multiplied by the product of the number of turns in the coil (N) and the area of the coil (A). In mathematical form:

$$\Phi = N \times A \times B^{\perp}$$

The "turns-area product" refers to the parameters of this equation which are affected by coil geometry, i.e. (N x A).

"Conductive tracks on the motherboard"

The Examiner objects to the term "conductive tracks on the motherboard" as being unclear. The Applicant asserts that conductive tracks are shown in the application, in particular in Figure 3, connecting the various coil means together. The motherboard is omitted in this figure for clarity, but can be seen outlined in Figure 6 (in Figure 6 the tracks are omitted for clarity). The coil means are described as being mounted on a motherboard, and are described as being connected in series with each other. The connections of the coil means in Figure 6 are shown in the circuit diagram of Figure 7. As is well known in the art, such connections are made using conductive tracks, which may be located on the motherboard that the coil means are mounted on.

"Interrelationship of Fifth and Sixth Coil Means"

As regards the objection over the definition of the fifth and sixth coil means as claimed in claim 18, the Applicant anticipates that the above explanation of the notional circle will have clarified this to the Examiner. In any case, the fifth and sixth coil means are located on a *second* notional circle that is concentric to the first notional circle, having a greater diameter to the first notional circle (e.g. in Figures 5 and 6, the circle shown as having a radius r_2).

In this case, the fifth coil means is described as being located on the circumference of the second notional circle, along the radius of the second notional circle upon which the first coil means can be located. With reference to Figure 5, it can be seen that the coil a2x can be substituted for the fifth coil means, located on the same radius as the first coil means, a1x. The coil a2x can also be seen to have its axis tangential to the second notional circle. Similar reasoning can be also applied to the sixth, seventh and eighth coil means (represented as example in Figure 6 by coils d2x, a2y, and d2y respectively). In light of the above explanation, the Applicant respectfully requests that the Examiner removes the relevant objection.

The Rejections under 35 U.S.C. § 102

The Examiner has rejected Claims 10-12 and 14 under 35 U.S.C. 102(b) as being anticipated by Sorenson et al., U.S. Patent No. 5,652,506. Applicant respectfully traverses the rejection.

Applicant believes that an incorrect interpretation of the term "notional circle" may have given rise to this rejection. The Examiner refers to Figures 9-11 of the cited document when describing the earlier disclosure. However, if one refers additionally to Figure 13 of Sorensen (which forms part of the same embodiment), the differences between the cited reference and the present invention are easy to see.

The Examiner describes the claimed "first coil means" as coil 30 of Sorensen, and the "second coil means" as coil 300. Applicant agrees that coils 30 and 300 are located on a first notional circle (the circle having at its centre the conductor 20'), and that the axis of coil 30 is tangential to the notional circle while the axis of coil 300 extends radially of the notional circle. However, in contrast to what is claimed in present claim 10, the axes of coils 30 and 300 are orthogonal to each other, and are therefore not substantially parallel as required by claim 10.

While the Examiner asserts that the claimed third and fourth coil means are found as coils 340 and 34 of Sorensen respectively, Applicant points out that it is a requirement of claim 10 that the third and fourth coil means are "located on the circumference of the notional circle close to

the first and second coil means", i.e. the same notional circle as the first and second coils. It can be readily seen from Figure 13 of the cited reference that coils 340 and 34 are not located on the circumference of the same notional circle as that of coils 30 and 300.

In addition, the third and fourth coil means are described in claim 10 as having axes that are substantially parallel. The axes of coils 340 and 34 are orthogonal to each other, and are not substantially parallel.

Applicant therefore asserts that the configuration as claimed in claim 10 is neither taught nor suggested in the cited prior art. As the remaining claims depend from claim 10, Applicant asserts that these claims benefit from the novelty and inventiveness of claim 10.

CONCLUSION

Applicant has made a diligent effort to address the objections and rejections identified by the Examiner, and respectfully submits that the outstanding objections and rejections in the Office Action have been overcome. In view of the above remarks, all pending claims are believed to be patentable, and thus, the case is in condition for allowance. Accordingly, a Notice of Allowability is respectfully requested at the Examiner's earliest convenience. In the event that there is any question concerning this response, or the application in general, Applicant respectfully requests that the Examiner contact Applicant's attorney at the telephone number listed below so that additional changes may be discussed.

Respectfully submitted,

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Date

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